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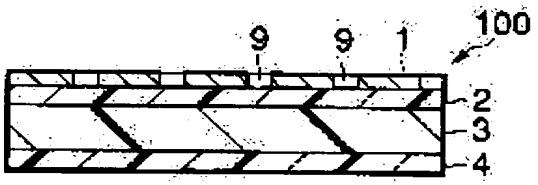
(54) HEAT-SENSITIVE MELTING FLUORESCENT INK RIBBON, METHOD FOR MANUFACTURING IT, PRINTED MATTER AND PRINTING METHOD USING THE INK RIBBON, AND PRINTER THEREFOR

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a heat-sensitive melting ink ribbon of sufficient printability, hard to be forget and easily judging whether a subject is genuine or forged.
SOLUTION: A fluorescent ink ribbon is provided with a sheet like base, a fluorescent ink layer formed on the base and contains a fluorescent body and a heat-fusion resin and also with a fluorescent ink layer with an opening of the given pattern.



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[Claim(s)]

[Claim 1] A sensible-heat melting mold fluorescence ink ribbon characterized by providing a sheet-like base material and a fluorescence ink layer which is formed on this sheet-like base material, contains a fluorescent substance and thermofusion nature resin, and has puncturing of a predetermined pattern.

[Claim 2] A sensible-heat melting mold fluorescence ink ribbon according to claim 1 characterized by arranging a coloring ink layer containing a coloring agent by turns [said / fluorescence ink layer and by turns], and preparing it further on said sheet-like base material.

[Claim 3] Said coloring ink layer is a sensible-heat melting mold fluorescence ink ribbon according to claim 2 which has puncturing of a predetermined pattern.

[Claim 4] Said fluorescence ink layer is a sensible-heat melting mold fluorescence ink ribbon given in claim 1 characterized by containing a coloring agent further thru/or any 1 term of 3.

[Claim 5] Fluorescence ink spreading liquid which viscosity measured by ZAN cup measuring method is 10 thru/or 18 seconds, and contains a fluorescent substance and thermofusion nature resin at least on a sheet-like base material by coverage 0.5 thru/or 2.5 g/m2 A mesh is the manufacture method of a sensible-heat melting mold fluorescence ink ribbon which carries out coating by gravure coating method using depth 15 of 150 thru/or 250 meshes, and a slot thru/or the gravure version of 20, and is characterized by including a production process which forms a fluorescence ink layer which has puncturing of a predetermined pattern.

[Claim 6] For 13 thru/or 16 seconds, and said coverage, said viscosity is [1.0 thru/or 2.0 g/m2, and said mesh / depth of said slot] 160 thru/or 200 meshes, and the manufacture method of a sensible-heat melting mold fluorescence ink ribbon according to claim 5 characterized by being 16 thru/or 18.

[Claim 7] A manufacture method of a sensible-heat melting mold fluorescence ink ribbon according to claim 5 characterized by forming further a coloring ink layer containing a coloring agent and thermofusion nature resin by turns [said / fluorescence

ink layer and by turns] on said sheet-like base material.

[Claim 8] Said coloring ink layers are coverage 1.0 - 1.8 g/m2 about fluorescence ink spreading liquid with which viscosity measured by ZAN cup measuring method is 10 thru/or 18 seconds, and contains a fluorescent substance and thermofusion nature resin at least on said sheet-like base material. A mesh is the manufacture method of a sensible-heat melting mold fluorescence ink ribbon according to claim 7 which coating is carried out by gravure coating method using 170-220 meshes and the gravure version of depth 45-70 of a slot, and is characterized by having puncturing of a predetermined pattern.

[Claim 9] Said fluorescence ink layer is the manufacture method of a sensible-heat melting mold fluorescence ink ribbon given in claim 5 characterized by containing a coloring agent further thru/or any 1 term of 8.

[Claim 10] The printing method using the sensible-heat melting mold ink ribbon which a fluorescence ink layer of this ink ribbon is contacted to imprinted material, applies a heating record means using a sensible-heat melting mold fluorescence ink ribbon given in claim 1 thru/or any 1 term of 4 from on a principal plane of another side of this sheet-like base material, carries out the heating imprint of this fluorescence ink layer on this imprinted material, and is characterized by to include a production process which forms a fluorescence ink printing layer.

[Claim 11] An airline printer characterized by providing a sensible-heat melting mold fluorescence ink ribbon given in claim 1 thru/or any 1 term of 4, a heating record means established on this sensible-heat melting mold fluorescence ink ribbon, a means to drive this heating record means, and a pressure-welding means which countered this heating record means and was established through this sensible-heat melting mold fluorescence ink ribbon.

[Claim 12] Printed matter characterized by providing a base material and a fluorescence ink image which has puncturing of a predetermined pattern printed on this base material.

[Claim 13] Said fluorescence ink image is printed matter according to claim 12 characterized by containing a coloring agent further.

[Claim 14] Printed matter according to claim 11 characterized by providing further a coloring ink image which has puncturing of a predetermined pattern printed on this base material.

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the

sensible-heat melting mold ink ribbon used for the goods for a truth judging with which fake alteration prevention technology, such as gold notes, such as a stock certificate, a security, and a gift certificate, and an important document, was given, its manufacture method, the printing method using this ink ribbon, and printed matter.

[0002]

[Description of the Prior Art] An image formation process is simple and low cost, and the image recording technology using a sensible-heat melting mold ink ribbon spreads widely in recent years, and is put in practical use as printing of a word processor or the printer for personal computers of low cost, and an image recording process.

[0003] By changing the component, various objects are prepared, and the sensible-heat melting mold ink ribbon is broadly used from the object for alphabetic character printing of monochrome to the full color object for image formation, and can be received easily. If the image recording using a melting mold ink ribbon performs image recording from this using the sensible-heat melting mold ink ribbon of the same class, fake alteration of the record image is easily possible. For this reason, the melting mold hot printing ink ribbon was behind in application on the goods of which high security nature, such as an ID card and negotiable securities, is required.

[0004] Generally, various printing technology, such as screen-stencil, gravure, and offset printing, is mainly applied to the image recording to an ID card or negotiable securities. However, the above-mentioned printing technology had the problem that cost was not fit for little printing highly etc.

[0005] Moreover, in order to prevent the unauthorized use by fake alteration of the goods of which these security nature is required, although original record images, such as a hologram, a micro alphabetic character, and image recording by the fluorescent substance, formed the image without direct relation on the transfered medium, if the cost rise by these was not avoided and it hit putting these in practical use, they were the things also accompanied by complication of an image formation process.

[0006] From these things, in the goods with which high security nature is demanded, fake alteration of alphabetic information is difficult, a truth judging is easy, and the fake alteration prevention technology of low cost is searched for more.

[0007]

[Problem(s) to be Solved by the Invention] The 1st purpose of this invention is used suitable for the goods for a truth judging, and has sufficient printing property, and it is difficult to forge and it is for a truth judging to offer an easy sensible-heat melting mold ink ribbon.

[0008] The 2nd purpose of this invention is used suitable for the goods for a truth judging, and has sufficient printing property, and it is difficult to forge and it is for a

truth judging to offer the manufacture method of an easy sensible-heat melting mold ink ribbon.

[0009] The 3rd purpose of this invention has sufficient printing property, and it is difficult to forge and it is to offer the printing method using the sensible-heat melting mold ink ribbon to which a truth judging can perform easy printing.

[0010] The 4th purpose of this invention has sufficient printing property, and it is difficult to forge and it is to offer the printed matter using the sensible-heat melting mold ink ribbon to which a truth judging can perform easy printing.

[0011] The 5th purpose of this invention has sufficient printing property, and it is difficult to forge and it is to offer the printing method using the sensible-heat melting mold ink ribbon to which a truth judging can perform easy printing.

[0012]

[Means for Solving the Problem] This invention is formed on a sheet-like base material and this sheet-like base material the 1st, contains a fluorescent substance and thermofusion nature resin, and offers a sensible-heat melting mold fluorescence ink ribbon characterized by providing a fluorescence ink layer which has puncturing of a predetermined pattern.

[0013] This inventions are coverage 0.5 thru/or 2.5 g/m2 about fluorescence ink spreading liquid with which viscosity measured by ZAN cup measuring method is 10 thru/or 18 seconds, and contains a fluorescent substance and thermofusion nature resin at least on a sheet-like base material in the 2nd. Coating of the mesh is carried out by gravure coating method using the depth 15 of 150 thru/or 250 meshes, and a slot thru/or the gravure version of 20, and a manufacture method of a sensible-heat melting mold fluorescence ink ribbon characterized by including a production process which forms a fluorescence ink layer which has puncturing of a predetermined pattern is offered.

[0014] This invention is formed on a sheet-like base material and this sheet-like base material the 3rd. Contain a fluorescent substance and thermofusion nature resin, and a sensible-heat melting mold fluorescence ink ribbon containing a fluorescence ink layer which has puncturing of a predetermined pattern is used. Contact a fluorescence ink layer of this ink ribbon to imprinted material, and a heating record means is applied from on a principal plane of another side of this sheet-like base material. A printing method using a sensible-heat melting mold ink ribbon which carries out the heating imprint of this fluorescence ink layer on this imprinted material, and is characterized by including a production process which forms a fluorescence ink printing layer is offered.

[0015] A sensible-heat melting mold fluorescence ink ribbon containing a fluorescence ink layer which this invention is formed on a sheet-like base material and this

sheet-like base material the 4th, contains a fluorescent substance and thermofusion nature resin, and has puncturing of a predetermined pattern, An airline printer characterized by providing a heating record means established on this sensible-heat melting mold fluorescence ink ribbon, a means to drive this heating record means, and a pressure-welding means which countered this heating record means and was established through this sensible-heat melting mold fluorescence ink ribbon is offered.

[0016] This invention offers printed matter characterized by providing a fluorescence ink image which has puncturing of a predetermined pattern printed [5th] on a base material and this base material.

[0017]

[Embodiment of the Invention] The sensible-heat melting mold fluorescence ink ribbon of this invention is formed on a sheet-like base material and this sheet-like base material, contains a fluorescent substance and thermofusion nature resin, and has the fluorescence ink layer which has puncturing of a predetermined pattern.

[0018] Moreover, the printed matter of this invention was printed using the above-mentioned ink ribbon, and has a base material and the fluorescence ink image which has puncturing of the predetermined pattern printed on this base material.

[0019] Here, a fluorescence ink layer says the layer which consists of a fluorescent substance and thermofusion nature resin at least. In a fluorescence ink layer, the fluorescent substance used is transparence or white preferably, and it is desirable for a user to be hard to be recognized under the light.

[0020] If this invention is used, predetermined puncturing can be formed in the image printed using this ink ribbon by forming predetermined puncturing in the fluorescence ink layer of an ink ribbon. With the technology of a copy etc., such puncturing cannot be formed, unless it is difficult to carry out fake alteration and it uses the fluorescence ink ribbon of this invention. According to this invention, ultraviolet rays are irradiated at this fluorescence ink layer, and the goods by which fake alteration was carried out can be easily recognized by checking whether predetermined puncturing exists in an image.

[0021] The fluorescence ink layer itself may be colored even if transparent.

[0022] When the fluorescence ink layer which added the coloring agent is used for this fluorescence ink layer, under the light, it is easy to check various image information, such as an alphabetic character and a person, by looking, and it can be printed.

[0023] The manufacture method of the sensible-heat melting mold fluorescence ink ribbon of this invention The fluorescence ink spreading liquid which the viscosity measured by the ZAN cup measuring method is 10 thru/or 18 seconds, and contains a fluorescent substance and thermofusion nature resin at least on a sheet-like base material by coverage 0.5 thru/or 2.5 g/m2 Coating of the mesh is carried out by the

gravure coating method using the depth 15 of 150 thru/or 250 meshes, and a slot thru/or the gravure version of 20, and it includes the production process which forms the fluorescence ink layer which has puncturing of a predetermined pattern.

[0024] According to the manufacture method of the sensible-heat melting mold fluorescence ink ribbon of this invention, the fluorescence ink ribbon which has above-mentioned predetermined puncturing can be manufactured cheaply and easily using general-purpose gravure only by specifying the viscosity of ink spreading liquid, coverage, and the mesh and depth of the gravure version.

[0025] Using an above-mentioned sensible-heat melting mold fluorescence ink ribbon, the printing method of this invention contacts the fluorescence ink layer of this ink ribbon to imprinted material, applies a heating record means from on the principal plane of another side of this sheet-like base material, carries out the heating imprint of this fluorescence ink layer on this imprinted material, and includes the production process which forms a fluorescence ink printing layer.

[0026] Moreover, the airline printer of this invention possesses an above-mentioned sensible-heat melting mold fluorescence ink ribbon, the heating record means established on the sensible-heat melting mold fluorescence ink ribbon, a means to drive a heating record means, and the pressure-welding means which countered the heating record means and was established through the sensible-heat melting mold fluorescence ink ribbon.

[0027] According to the airline printer and the printing method of this invention, forgery is difficult by using an above-mentioned fluorescence ink ribbon, without spoiling the printing property, using a general-purpose heating record means, it can be cheap and easy printing of a truth judging can be printed easily.

[0028] In this invention, it is desirable still more desirable that it is below diameter 0.1mm, and the magnitude of puncturing is 0.03-0.06mm in diameter. When it is hard coming to generate trouble in the property of an image when printing according that the magnitude of puncturing is below diameter 0.1mm to an ink ribbon is performed, there is orientation for fake alteration to become more difficult.

[0029] The viscosity of the fluorescence ink layer spreading liquid measured by the ZAN cup measuring method is 13 thru/or 16 seconds preferably. Moreover, the coverage of spreading liquid is 1.0 thru/or 2.0 g/m2 preferably. The mesh of the gravure version is desirable, the depth of 160 thru/or 200 meshes, and the slot of those is desirable, and it is 16 thru/or 18.

[0030] In addition, a ZAN cup measuring method is a method which measures kinematic viscosity as flow characteristic [of spreading liquid], and is used for the viscosity management at the time of coating. In this invention, filled spreading liquid in

the cup of about 30ml constant-volume product, it was made to flow down from a hole with the fixed aperture of about 5mm, and the flowing-down time amount was measured.

[0031] Moreover, on a sheet-like base material, the coloring ink layer containing a coloring agent can be arranged a fluorescence ink layer and by turns, and can be prepared further at the sensible-heat melting mold fluorescence ink ribbon of this invention.

[0032] By using the ink ribbon which has arranged the coloring ink layer and the fluorescence ink layer by turns, printing by the usual sensible-heat melting mold ink layer and printing by the fluorescence ink layer which has puncturing of a predetermined pattern can be performed by one ink ribbon.

[0033] Moreover, predetermined puncturing can be further prepared in an above-mentioned coloring ink layer.

[0034] When printing such a coloring ink layer, the coverage of ink is 1.2 thru/or 1.5 g/m2 preferably [it is desirable and] to 1.0 - 1.8 g/m2 and a pan. Viscosity is 13 thru/or 16 seconds still more preferably for 10.0 to 18.0 seconds preferably. Moreover, 170-220 meshes of mesh of the gravure version are 180 thru/or 200 meshes still more preferably. Depth is 55 thru/or 65 preferably to desirable 45-desirable 70, and a pan.

[0035] It is difficult to reproduce puncturing correctly with the technology of a copy etc. For this reason, the image printed using the coloring ink layer in which puncturing was formed cannot be formed, either, unless it is difficult to carry out fake alteration of the puncturing and it uses the fluorescence ink ribbon of this invention. The truth judging of the image printed using both the coloring ink layer which has puncturing, and the fluorescence ink layer which has puncturing is attained by both the top where fake alteration is more difficult, and under the light and UV irradiation, and security nature becomes high further.

[0036] Moreover, the under coat layer for making good exfoliation of the fluorescence ink layer at the time of heating can be further prepared between a sheet-like base material and a fluorescence ink layer.

[0037] Furthermore, a back coat layer can be prepared on opposite Men with the fluorescence ink layer of a sheet-like base material.

[0038] The ink spreading liquid used contains resin, a wax, a solvent, and a coloring agent.

[0039] As resin, the mixture of acrylic resin, epoxy system resin, polyester system resin, polyurethane system resin, and these resin etc. can be mentioned.

[0040] As a wax, carnauba wax, paraffin wax, a rice wax, ester wax, a candelilla wax, polyethylene wax, a micro crystal wax, an amide wax, ester wax, oxidation polyethylene

wax, etc. can be mentioned.

[0041] As a solvent, toluene, a methyl ethyl ketone, ethanol, a xylene, a cyclohexanone, etc. can be mentioned.

[0042] As a coloring agent, pigments and colors, such as carbon black, the first yellow G, benzidine yellow, pigment yellow, India first Orange, IRUGA gin red, Carmine FB, permanent Bordeaux FRR, pigment Orange R, Lithol Red 2G, lake red C, Rhodamine FB, Rhodamine B, copper phthalocyanine blue, pigment blue, brilliant green B, Phthalocyanine Green, and Quinacridone, can be used if needed.

[0043] As a fluorescent pigment, it is the material which emits light in fluorescence by UV irradiation, and can divide roughly into an inorganic fluorescent substance and an organic fluorescent substance. it is about most lights -- it is -- it can divide roughly into the colorless fluorescent substance which is not absorbed at all and the colored fluorescent substance which has a certain amount of absorption band in a visible region. in this invention, it is about most lights -- it is -- it is desirable to use the colorless fluorescent substance which is not absorbed at all.

[0044] As a colorless inorganic fluorescent substance, the crystal of oxides, such as calcium, Ba, Mg, Zn, and Cd, a sulfide, a silicate, phosphate, a tungstate, etc. can be used as a principal component, and the pigment which adds rare earth elements, such as metallic elements, such as Mg, Ag, Cu, Sb, and Pb, or lanthanoidses, as an activator, calcinates, and is obtained can be used.

[0045] As an inorganic fluorescent substance which emits light in red light, Y2O3:Eu, YVO4:Eu, Y2O2 S:Eu, 3.5MgO, 0.5MgF2GeO2:Mn, BO(Y, Gd)3:Eu, Y(P, V) O4:Eu, etc. can be used, for example.

[0046] As an inorganic fluorescent substance which emits light, green light, for example ZnO:Zn, Zn3SiO2:Mn, Zn3 S:Cu, aluminum, S:Cu (Zn, Cd), aluminum, ZnS:Cu, Au, aluminum, Zn2SiO4:Mn, ZnS:Ag, Cu, S:Cu (Zn, Cd), ZnS:Cu, Gd2O2 S:Tb, La2O2 S:Tb, and Y2SiO5: -- Ce and Tb -- Zn2GeO4:Mn, CeMgAl11O13:Tb, SrGa2S4:Eu2+, ZnS:Cu, CO, and MgO-nB2O3: -- Ce, Tb, LaOBr:Tb, Tm, La2O2 S:Tb, ZnS:Cu (Mn), etc. can be used.

[0047] As an inorganic fluorescent substance which emits light in blue glow, ZnS:Ag, CaWO4, Y2SiO5:Ce, ZnS:Ag, Ga and Cl, calcium2B5O3Cl:Eu2+, BaMgAl14O23:Eu2+, Sr3(PO2) 3 Cl:Eu, etc. can be used, for example.

[0048] As a wax which can be used as an under coat layer, carnauba wax, paraffin wax, a rice wax, ester wax, a candelilla wax, polyethylene wax, a micro crystal wax, an amide wax, ester wax, oxidation polyethylene wax, etc. can be mentioned.

[0049] Silicone system resin etc. can raise to a back coat layer as a heat-resistant slippage layer.

[0050] Hereafter, with reference to a drawing, this invention is further explained to details.

[0051] The front view showing an example of printing which used the fluorescence ink ribbon of this invention for drawing 2 for drawing which expresses typically the cross section of an example of the fluorescence ink ribbon of this invention to drawing 1 is shown respectively.

[0052] This fluorescence ink ribbon has **-SUFIRUMU 3 made from polyethylene terephthalate whose thickness is 3.5-30.0 micrometers, the under coat layer 2 prepared on Men of one of these, the fluorescent substance and the fluorescence ink layer 1 which has the puncturing 9 with a predetermined pattern of 0.1mm or less, for example, diameter, including a coloring agent in arbitration prepared on it, and the back coat layer 4 prepared on Men of another side of **-SUFIRUMU 3 so that it may illustrate.

[0053] Here, coating of the fluorescence ink layer is carried out by the gravure coating method. In case coating of the fluorescence ink layer is carried out by the gravure coating method The depth of flute of the coverage of the fluorescence ink layer spreading liquid used, viscosity, and the gravure version of gravure coating equipment The fluorescence ink spreading liquid which it sets within a certain fixed limits, i.e., the viscosity measured by the ZAN cup measuring method is 10 thru/or 18 seconds, and contains a fluorescent substance and thermofusion nature resin at least by coverage 0.5 thru/or 2.5 g/m2 By carrying out coating using the depth 15 of 150 thru/or 250 meshes, and a slot thru/or the gravure version of 20, a mesh can form the puncturing 9 of a predetermined pattern in the fluorescence ink layer of a fluorescence ink ribbon.

[0054] If this ink ribbon is used and it prints on a transfered medium as shown in drawing 2 , existence of puncturing 9 will be easily accepted in the printed alphabetic information. Thus, it can judge easily whether fake alteration is performed by checking existence of this puncturing or its pattern.

[0055] Moreover, the image which has puncturing emits light by irradiating ultraviolet rays at this alphabetic information. Thereby, it can judge easily whether fake alteration is performed.

[0056] Drawing 3 shows drawing showing an example of an ID card as printed matter printed using the ink ribbon of this invention.

[0057] This ID card has the configuration by which the portrait image 203 and alphabetic information 206 were printed respectively on a base material 201 so that it may illustrate. Alphabetic information 206 is printed using the ink ribbon of this invention, when it sees in near, existence of the same puncturing as printing shown in drawing 2 which is not illustrated is accepted, and, on the other hand, there is no problem in the printing property. Thus, it can judge easily whether fake alteration is

performed by checking this puncturing.

[0058] Furthermore, it can judge easily whether fake alteration is performed by irradiating ultraviolet rays at alphabetic information 206, and checking the luminescence.

[0059] Moreover, drawing which expresses typically the cross section of other examples of the fluorescence ink ribbon of this invention to drawing 4 is shown.

[0060] This fluorescence ink ribbon so that it may illustrate For example, **-SUFIRUMU 3 made from polyethylene terephthalate whose thickness is 3.5-30.0 micrometers, The under coat layer 2 prepared on Men of one of these, and the fluorescence ink layer 7 transparent under the light which is prepared on the UC layer 2 and has the puncturing 9 with a predetermined pattern of 0.1mm or less, for example, diameter, It has the fluorescence ink layer 7, the coloring ink layer 8 which has the puncturing 6 with a predetermined pattern of 0.1mm or less, for example, diameter, prepared on the UC layer 2 by turns, and the back coat layer 4 prepared on Men of another side of **-SUFIRUMU 3.

[0061] Here, coating of the fluorescence ink layer is carried out like the ink ribbon shown in drawing 1 by the gravure coating method. In case coating of the coloring ink layer is carried out by the gravure coating method The depth of flute of the coverage of the coloring ink layer spreading liquid used, viscosity, and the gravure version of gravure coating equipment The fluorescence ink spreading liquid which it sets within a certain fixed limits, i.e., the viscosity measured by the ZAN cup measuring method is 10 thru/or 18 seconds, and contains a fluorescent substance and thermofusion nature resin at least by coverage 1.0 thru/or 1.8 g/m2 By carrying out coating using the depth 45 of 170 thru/or 220 meshes, and a slot thru/or the gravure version of 70, a mesh can form the puncturing 6 of a predetermined pattern in the coloring ink layer of a fluorescence ink ribbon.

[0062] If this ink ribbon is used, printing by the usual sensible-heat melting mold ink layer and printing by the fluorescence ink layer which has puncturing of a predetermined pattern can be performed by one ink ribbon. Moreover, if the coloring ink layer of this ink ribbon is used and it prints on a transfered medium, as shown in drawing 2 , existence of puncturing 9 will be easily accepted in the printed alphabetic information. Thus, it can judge easily whether fake alteration is performed by checking existence of this puncturing or its pattern. Moreover, although the information printed by the fluorescence ink layer is difficult to check by looking under the light, irradiate ultraviolet rays, a fluorescent substance is made to emit light, and it can judge easily whether fake alteration is performed by checking the printed information and existence of puncturing.

[0063] This schematic drawing that expresses an example of the airline printer concerning this invention to drawing 5 is shown.

[0064] This airline printer 10 has CPU17 which controls the thermal head 14 and platen roller 15 which have been countered and arranged through an ink ribbon 11 and the recording paper P between the reel 12 for a delivery which lets out an ink ribbon 11, the reel 13 for rolling up which rolls round the ink ribbon 11 which it let out from this reel 12 for a delivery, and reels 11 and 12, and the thermal head drive circuit 16 and this which carry out the energization drive of the thermal head 14 so that it may illustrate.

[0065] The thermal head drive circuit 16 is controlled by CPU17, and supplies drive current to a thermal head 14 according to alphabetic information 18. The thermal head drive circuit 16 supplies drive current to a thermal head 14, when a thermal head 14 is located on a fluorescence ink layer, and at the time of the information for which alphabetic information 18 should be printed by the coloring ink layer, when using the ink ribbon which prepared the fluorescence ink layer and the coloring ink layer by turns, and a thermal head 14 is located on a coloring ink layer, it supplies drive current to a thermal head 14.

[0066] The example of this invention is explained below an example.

[0067] In producing the sensible-heat melting mold fluorescence ink ribbon of example 1 this invention, the raw material of the presentation shown below was first prepared for under coat layer coating liquid A production.

[0068] Under coat layer coating liquid A carnauba wax No. 1 50 weight sections polyethylene wax 30 weight sections toluene 93 weight sections methyl ethyl ketone The coating liquid of the 93 weight sections above-mentioned presentation was kneaded with the ball mill for 3 hours, and the thermofusion nature coating liquid A for viscosity 17 seconds was produced.

[0069] Next, the raw material of the presentation shown below was prepared for fluorescence ink layer coating liquid B production.

[0070] Fluorescence ink layer coating liquid BLUMIKOL1002 (product made from Japanese Fluorescence Chemistry) 15 weight sections ethylene-vinyl acetate copolymer resin (Mitsui and Trade name Made from DEYUPON poly chemical: EVAFLEX210) 85 weight sections carnauba wax No. 1 Five weight sections polyethylene wax Five weight sections toluene 185 weight sections methyl ethyl ketone The coating liquid of the 185 weight sections above-mentioned presentation was kneaded with the ball mill for 5 hours, and the fluorescence ink layer coating liquid B for viscosity 15 seconds was produced.

[0071] Next, the polyethylene terephthalate film (trade name by PET film Toray Industries, Inc.: T-71) with a thickness of 4.5 micrometers was prepared, the silicone

tree was applied and dried with the general-purpose coater as a heat-resistant slippage agent at the back, and the coating original fabric was obtained.

[0072] Then, the above-mentioned under coat layer coating liquid A was prepared, and with Ohio mold mesh:175 line and the gravure coater using the gravure version of depth:80, thermofusion nature presentation coating liquid A was applied to the above-mentioned coating original fabric, it dried to it, and the under coat layer with a thickness of 1.5 micrometers was produced.

[0073] Furthermore, Ohio mold mesh:175 line, depth: With the gravure coater using the gravure version of 18, fluorescence ink layer coating liquid B was applied, it dried on thermofusion ****, the fluorescence ink layer of coverage 1.2 g/m2 was produced, and the sensible-heat melting mold fluorescence ink ribbon (1) of this invention was manufactured.

[0074] Next, the obtained sensible-heat melting mold fluorescence ink ribbon (1) is used, and it is melting mold hot printing Label Printer TEC. By CB-418 (Toshiba TEC [Corp.] Corp. make), alphabetic information was formed in transferred paper TRW-1 (coat paper by Jujo Paper Co., Ltd.) in a second in the printing speed of 2 inches/second, and 4 inches /.

[0075] It inspected visually about the acquired alphabetic information, and the existence of the problem in the existence and the printing property of a printing chip (part where ink is not imprinted) of alphabetic information was investigated. Moreover, the existence of the non-visibility under the light of proper information, the visibility at the time of UV irradiation, a print chip, a print property, and the problem in existence of puncturing was inspected.

[0076] The same under coat layer coating liquid A as an example 2 thru/or five examples 1 was prepared.

[0077] Next, the raw material of the presentation shown below was prepared for fluorescence ink layer coating liquid C production.

[0078] Fluorescence ink layer coating liquid CLUMIKOL1002 (product made from Japanese Fluorescence Chemistry) 15 weight sections ethylene vinyl acetate is a pile and coalesce resin (Mitsui and Trade name Made from DEYUPON poly chemical: EVAFLEX210). 85 weight sections carnauba wax No. 1 Five weight sections polyethylene wax Five weight sections toluene 185 thru/or 200 weight sections methyl ethyl ketone The coating liquid of 185 thru/or the 200 weight sections above-mentioned presentation was kneaded with the ball mill for 5 hours, and the fluorescence ink layer coating liquid C which has various viscosity as shown in the following table 1 was produced.

[0079] Next, the polyethylene terephthalate film with a thickness of 4.5 micrometers

was prepared, silicone resin was applied and dried with the general-purpose coater as a heat-resistant slippage layer at the back, and the coating original fabric was obtained.

[0080] Then, the above-mentioned under coat layer coating liquid A was prepared, and with Ohio mold mesh:175 line and the gravure coater using the gravure version of depth:80, thermofusion nature presentation coating liquid C was applied to the above-mentioned coating original fabric, it dried to it, and thermofusion **** of coverage 2.0 g/m2 was produced.

[0081] Furthermore, with the gravure coater using the gravure version of the Ohio mold, it was made to change variously like the publication to a table 1 of the mesh and depth of coverage and the gravure version, and on the under coat layer, fluorescence ink layer coating liquid C was applied, it dried, the fluorescence ink layer was produced, and a sensible-heat melting mold fluorescence ink ribbon (2), (3), (4), and (5) were manufactured.

[0082] About the obtained fluorescence ink ribbon, alphabetic information was formed like the example 1, the existence of the problem in the existence and the printing property of a printing chip of alphabetic information was investigated, and the existence of the non-visibility under the light of proper information, the visibility at the time of UV irradiation, a print chip, a print property, and the problem in existence of puncturing was inspected further.

[0083] The obtained result is similarly shown in a table 1.

[0084]

[A table 1]

表 1

評価項目	実施例				
	(1)	(2)	(3)	(4)	(5)
インクの塗布量(g／m 2)	1. 2	0. 3	1. 6	0. 6	0. 8
インク塗液の粘度(sec)	15. 0	16. 0	20. 0	15. 0	15. 5
グラビア版のメッシュ	175	200	200	300	240
グラビア版の深度	18	18	20	15	5
印画欠け	○	○	○	○	○
印画特性	○	△	○	○	○
可視光下での非視認性	○	○	○	○	○
紫外線照射時の視認性	○	○	○	○	○
被転写紙上に形成した印画中のピンホールの存在	○	△	△	△	△

[0085] It turned out that there is no print chip in the proper information which consists of puncturing of a predetermined pattern by which checking by looking is easy at the time of UV irradiation, and the print was carried out in the transferred paper from a

table 1 although the sensible-heat melting mold fluorescence ink ribbon (1) of this invention is very difficult to check by looking under the light, and it is satisfactory also in a print property.

[0086] Furthermore, it has checked that puncturing patternized by the proper information formed in the transferred paper of the sensible-heat melting mold fluorescence ink ribbon of this invention existed.

[0087] On the other hand, a sensible-heat melting mold fluorescence ink ribbon (2), (3), (4), and (5) Although it is the number of mesh of the gravure version to be used, depth and the viscosity of thermofusion nature ink presentation coating liquid, and the ink ribbon that changed coverage in the manufacturing process of the sensible-heat melting mold fluorescence ink ribbon (1) of this invention and it is very difficult to check by looking under the light also about these It turned out that checking by looking is easy at the time of UV irradiation, there is no print chip in the proper information by which the print was carried out in the transferred paper, and it is satisfactory also in a print property.

[0088] Although it was hard to check patternized puncturing as proper information somewhat, the print property that there is no print chip and it is satisfactory was acquired. Moreover, it is very difficult for all to check existence of a fluorescent substance by looking under the light, and it had sufficient security nature.

[0089] The example which prepared the fluorescence ink layer and the coloring ink layer by turns on the example 6, next the sheet base material is shown.

[0090] The same under coat layer coating liquid A as an example 1 and fluorescence ink layer coating liquid B were prepared, and the raw material of the presentation shown below was further prepared for coloring ink layer coating liquid D production.

[0091]

Coloring ink layer coating liquid D carbon black (Degussa AG make trade name-rintex25) 30 weight sections ethylene-vinyl acetate copolymer resin (Mitsui and Trade name Made from DEYUPON poly chemical: EVAFLEX210) 20 weight sections carnauba wax No. 1 Five weight sections polyethylene wax Five weight sections toluene 93 weight sections methyl ethyl ketone The coating liquid of the 93 weight sections above-mentioned presentation was kneaded with the ball mill for 5 hours, and the coloring ink layer coating liquid D for viscosity 15 seconds was produced.

[0092] Next, the polyethylene terephthalate film (trade name by PET film Toray Industries, Inc.: T-71) with a thickness of 4.5 micrometers was prepared, silicone resin was applied and dried with the general-purpose coater as a heat-resistant slippage agent at the back, and the coating original fabric was obtained.

[0093] Then, the above-mentioned under coat layer coating liquid A was applied and

dried to the coating original fabric obtained with Ohio mold mesh:175 line and the gravure coater using the gravure version of depth:80, and the under coat layer with a thickness of 1.5 micrometers was produced.

[0094] Then, Ohio mold mesh:175 line, depth : with the gravure coater using the gravure version of 60 Fluorescence ink layer coating liquid B on the obtained under coat layer in predetermined magnitude Set a predetermined gap, apply and dry, produce two or more fluorescence ink layers of thickness 1.5 g/m2, can come, simultaneously by the mutual coating method with Ohio mold mesh:175 line and the gravure coater using the gravure version of depth:18 On the under coat layer, coloring ink layer coating liquid D was applied, it dried, the black ink layer of thickness 1.2 g/m2 was produced between fluorescence ink layers, and the sensible-heat melting mold fluorescence ink ribbon (6) of this invention was manufactured.

[0095] About the obtained fluorescence ink ribbon (6), alphabetic information was formed like the example 1, the existence of the problem in the existence and the printing property of a printing chip of alphabetic information was investigated, and the existence of the non-visibility under the light of proper information, the visibility at the time of UV irradiation, a print chip, a print property, and the problem in existence of puncturing was inspected further. The result by which the reflection density of black ink may furthermore also have been measured is similarly shown in the following table 3.

[0096] The same fluorescence ink layer coating liquid C as seven to example 10 example 1, and the same under coat layer coating liquid A and an example 2 was prepared, and the raw material of the presentation shown below was prepared for coloring ink layer coating liquid E production.

[0097]

Coloring ink layer coating liquid E carbon black (Degussa AG make trade name-rintex25) 30 weight sections ethylene-vinyl acetate copolymer resin (Mitsui and Trade name Made from DEYUPON poly chemical: EVAFLEX210) 20 weight sections carnauba wax No. 1 Five weight sections polyethylene wax Five weight sections toluene 93 thru/or 120 weight sections methyl ethyl ketone The coating liquid of 93 thru/or the 120 weight sections above-mentioned presentation was kneaded with the ball mill for 5 hours, and the coloring ink layer E which has various viscosity as shown in the following table 2 was produced.

[0098]

[A table 2]

表2(黒)

評価項目	実施例				
	(6)	(7)	(8)	(9)	(10)
黒インクの塗布量(g／m 2)	1. 5	2. 0	1. 6	1. 6	1. 5
黒インク塗液の粘度(sec)	15. 0	16. 0	20. 0	15. 0	15. 5
グラビア版のメッシュ	175	200	200	150	170
グラビア版の深度	60	65	65	60	90

[0099] Next, the polyethylene terephthalate film with a thickness of 4.5 micrometers was prepared, silicone resin was applied and dried with the general-purpose coater as a heat-resistant slippage layer at the back, and the coating original fabric was obtained.

[0100] Then, the above-mentioned under coat layer coating liquid A was prepared, and with Ohio mold mesh:175 line and the gravure coater using the gravure version of depth:80, thermofusion nature presentation coating liquid D was applied to the above-mentioned coating original fabric, it dried to it, and 2.0g in thickness/and the under coat layer of m2 were produced.

[0101] On an under coat layer, apply fluorescence ink layer coating liquid C, dry, produce a fluorescence ink layer, and can come [can use the gravure coater using the gravure version,] by the same conditions as a table 1, simultaneously by the mutual coating method on then, the conditions shown in a table 2 The gravure coater using the gravure version was used, and on the under coat layer, coloring ink layer coating liquid E was applied, it dried, the black ink layer was produced between fluorescence ink layers, and the sensible-heat melting mold ink ribbon (7) of this invention thru/or (10) were manufactured.

[0102] About the obtained fluorescence ink ribbon, alphabetic information is formed like an example 6. The existence of the problem in the existence and the printing property of a printing chip of alphabetic information is investigated. Furthermore, the existence of the non-visibility under the light of proper information, the visibility at the time of UV irradiation, a print chip, a print property, and the problem in existence of puncturing is inspected, and the result by which the reflection density of black ink may also have been measured further is similarly shown in the following table 3.

[0103]

[A table 3]

表3

評価項目	実施例				
	(6)	(7)	(8)	(9)	(10)
(黒及び蛍光)印画欠け	○	○	○	○	○
(黒及び蛍光)印画特性	○	△	○	○	○
(蛍光)可視光下での非視認性	○	○	○	○	○
(蛍光)紫外線照射時の視認性	○	○	○	○	○
(黒及び蛍光)被転写紙上に形成した印画中のピンホールの存在	○	△	△	△	△
(黒)反射濃度	1.66	1.63	1.62	1.68	1.69

[0104] As for a table 3, black and fluorescence showed that there was no print chip in the proper information using which the sensible-heat melting mold fluorescence ink ribbon (6) of this invention could be checked by looking when it is very difficult to check by looking under the light and it irradiated ultraviolet rays, and the print was carried out in the transferred paper, and concentration also with the reflection density of a black image sufficient by 1.6 or more was obtained.

[0105] It has checked that puncturing patternized by the proper information furthermore formed in the transferred paper of the sensible-heat melting mold ink ribbon of this invention existed. The sensible-heat melting mold fluorescence ink ribbon (7) of this invention thru/or (10) [moreover,] The number of mesh and depth of the gravure version which are used in the manufacturing process of a sensible-heat melting mold fluorescence ink ribbon (6), And they are the viscosity of a fluorescence ink layer and coloring ink layer coating liquid, and the ink ribbon which changed the amount of coating. It turned out that it can check by looking if it is very difficult to check by looking under the light also about these and it irradiates ultraviolet rays, and a print chip does not have black and fluorescence, either and concentration also with the reflection density of a black image sufficient by 1.6 or more is obtained.

[0106] It was hard to check by looking puncturing by which the coloring ink layer was patternized under the light and the fluorescence ink layer was patternized under UV irradiation as proper information somewhat. The print property that all do not have a print chip and are satisfactory was acquired. Moreover, a fluorescence ink layer is very difficult to check existence of a fluorescent substance by looking under the light, and it had sufficient security nature.

[0107] As mentioned above, by the example 1 thru/or 10, even if the sensible-heat melting mold ink ribbon of this invention formed alphabetic information in the transferred paper, a printing property was not affected at all, and fake alteration was difficult and it turned out that the puncturing can carry out the truth judging of the goods by which fake alteration was easily carried out under the light and UV irradiation

since it was able to check easily.

[0108]

[Effect of the Invention] According to this invention, it has sufficient printing property, and forgery is difficult for the goods for a truth judging, and can perform printing with an easy truth judging on them easily.

[Brief Description of the Drawings]

[Drawing 1] Drawing which expresses typically the cross section of an example of the fluorescence ink ribbon of this invention

[Drawing 2] Front view showing an example of printing using the fluorescence ink ribbon of this invention

[Drawing 3] Drawing showing an example of the printed matter of this invention

[Drawing 4] Drawing which expresses typically the cross section of other examples of the fluorescence ink ribbon of this invention

[Drawing 5] Drawing showing the outline of the thermal transfer printer used for this invention

[Description of Notations]

1 7 -- Fluorescence ink layer

2 -- Under coat layer

3 -- **-SUFIRUMU

4 -- Back coat layer

6 9 -- Puncturing

8 -- Coloring ink layer

10 -- Airline printer

12 -- Reel for a delivery

13 -- Reel for rolling up

14 -- Thermal head

15 -- Platen roller

16 -- Thermal head drive circuit

17 -- CPU

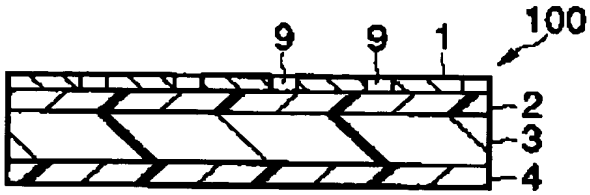
100,200 -- Ink ribbon

201 -- Base material

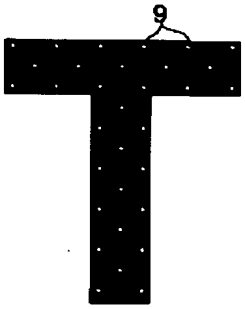
203 -- Portrait image

206 -- Alphabetic information

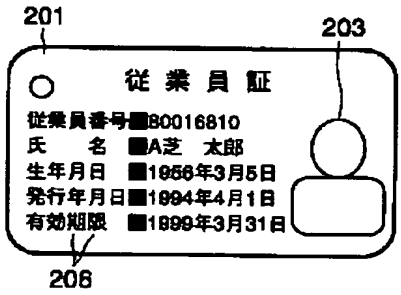
[Drawing 1]



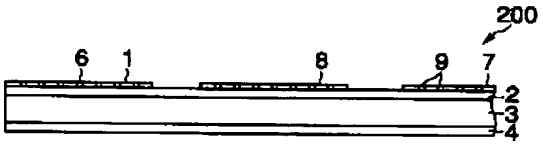
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Drawing 5]